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STRUCTURE FILE UPDATES:   12 NOV 2006  HIGHEST RN 913055-81-9
DICTIONARY FILE UPDATES:  12 NOV 2006  HIGHEST RN 913055-81-9

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http://www.cas.org/ONLINE/UG/regprops.html

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L30                 STR
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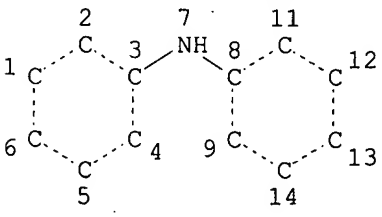


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS  13

STEREO ATTRIBUTES: NONE
L31                 SCR 1993
L33         37070 SEA FILE=REGISTRY SSS FUL L30 AND L31
L34                 STR

Cb—NH—Cb—NH2
1   2    3   4


NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
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GGCAT   IS MCY  UNS  AT   3
DEFAULT ECLEVEL IS LIMITED
ECOUNT  IS E6 C  AT   1
ECOUNT  IS E6 C  AT   3
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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE
L36 3209 SEA FILE=REGISTRY SUB=L33 SSS FUL L34

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SEARCH TIME: 00.00.01

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FILE COVERS 1907 - 14 Nov 2006 VOL 145 ISS 21
FILE LAST UPDATED: 12 Nov 2006 (20061112/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

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L103 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1000602 HCAPLUS
DN 143:289153
ED Entered STN: 15 Sep 2005
TI Reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels
IN **Loper, John T.; Griffin, Paul P.; Hutchison, David A.; Dittmeier, Robert T.**
PA **Afton Chemical Corporation, USA**
SO Eur. Pat. Appl., 18 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C10M0133-26
ICS C10L0001-22; C08F0008-46; C08F0008-32; C08F0255-00; C08F0255-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1574559	A1	20050914	EP 2005-251459	20050310 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
	US 2005202980	A1	20050915	US 2004-797877	20040310 <--
	CA 2497072	AA	20050910	CA 2005-2497072	20050216 <--
	AU 2005200694	A1	20050929	AU 2005-200694	20050216 <--
	JP 2005256001	A2	20050922	JP 2005-65730	20050309 <--
PRAI	US 2004-797877	A	20040310 <--		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1574559	ICM	C10M0133-26
	ICS	C10L0001-22; C08F0008-46; C08F0008-32; C08F0255-00; C08F0255-10
	IPCI	C10M0133-26 [ICM,7]; C10M0133-00 [ICM,7,C*]; C10L0001-22 [ICS,7]; C10L0001-10 [ICS,7,C*]; C08F0008-46 [ICS,7]; C08F0008-32 [ICS,7]; C08F0008-00 [ICS,7,C*]; C08F0255-00 [ICS,7]; C08F0255-10 [ICS,7]
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	ECLA	C10M133/26
US 2005202980	IPCI	C10M0133-46 [ICM,7]; C10M0133-56 [ICS,7]; C10M0133-00 [ICS,7,C*]; C10L0001-22 [ICS,7]; C10L0001-10 [ICS,7,C*]
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	NCL	508/232.000; 044/331.000; 044/347.000; 044/348.000; 508/291.000
	ECLA	C10M133/26
CA 2497072	IPCI	C10M0141-06 [ICM,7]; C10M0141-02 [ICS,7]; C10M0141-00 [ICS,7,C*]; C10L0001-14 [ICS,7]; C10L0001-18 [ICS,7]; C10L0001-22 [ICS,7]; C10L0001-10 [ICS,7,C*]
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	ECLA	C10M133/26
AU 2005200694	IPCI	C10M0133-04 [ICM,7]; C10M0133-12 [ICS,7]; C10M0133-00

[ICS,7,C*]

IPCR F02M0025-00 [I,C*]; F02M0025-00 [I,A]; C08F0008-00 [I,C*]; C08F0008-32 [I,A]; C08F0008-46 [I,A]; C08F0255-00 [I,C*]; C08F0255-00 [I,A]; C08F0255-10 [I,A]; C10L0001-10 [I,C*]; C10L0001-18 [I,A]; C10L0001-188 [I,A]; C10L0001-224 [I,A]; C10L0001-2383 [I,A]; C10M0129-00 [I,C*]; C10M0129-42 [I,A]; C10M0129-92 [I,A]; C10M0133-00 [I,C*]; C10M0133-06 [I,A]; C10M0133-12 [I,A]; C10M0133-16 [I,A]; C10M0133-26 [I,A]; C10M0133-56 [I,A]; C10M0159-00 [I,C*]; C10M0159-12 [I,A]; C10M0169-00 [I,C*]; C10M0169-04 [I,A]; C10N0030-04 [N,A]; C10N0030-10 [N,A]; C10N0040-04 [N,A]; C10N0040-25 [N,A]

JP 2005256001 IPCI C10M0133-16 [ICM,7]; C10L0001-18 [ICS,7]; C10L0001-22 [ICS,7]; C10L0001-10 [ICS,7,C*]; C10M0129-42 [ICS,7]; C10M0129-92 [ICS,7]; C10M0129-00 [ICS,7,C*]; C10M0133-06 [ICS,7]; C10M0133-12 [ICS,7]; C10M0133-56 [ICS,7]; C10M0133-00 [ICS,7,C*]; C10M0159-12 [ICS,7]; C10M0159-00 [ICS,7,C*]; C10M0169-04 [ICS,7]; C10M0169-00 [ICS,7,C*]; F02M0025-00 [ICS,7]; C10N0030-04 [ICS,7]; C10N0030-10 [ICS,7]; C10N0040-04 [ICS,7]; C10N0040-25 [ICS,7]

IPCR C08F0008-00 [I,C*]; C08F0008-32 [I,A]; C08F0008-46 [I,A]; C08F0255-00 [I,A]; C08F0255-00 [I,C*]; C08F0255-10 [I,A]; C10L0001-10 [I,C*]; C10L0001-2383 [I,A]; C10M0133-00 [I,C*]; C10M0133-26 [I,A]

FTERM 4H013/CE02; 4H104/BB18C; 4H104/BC06C; 4H104/BE11C; 4H104/BF03C; 4H104/LA02; 4H104/LA05; 4H104/PA02; 4H104/PA03; 4H104/PA05; 4H104/PA41

OS MARPAT 143:289153

AB Multifunctional dispersants for fuels and lubricants consist of the amination reaction products of a hydrocarbyl-substituted succinic acylating agent and a mixture of ≥1 aliphatic (nonpolymeric) polyamine and ≥1 aromatic (nonpolymeric) polyamine, in which the weight ratio of aliphatic to aromatic amine is 0.1-10:0.1-10 and the amination product contains ≥0.1 mol equivalent of the aromatic amine to 1 molar equivalent of the acylating agent. The aliphatic amine is a linear aliphatic (nonpolymeric) polyamine; the hydrocarbyl-substituted acylating agent consists of succinic anhydride substituted with a hydrocarbyl group with number-average mol. weight 200-10,000 (especially polyisobutenyl). The aromatic polyamine is N-phenylphenylenediamine, N-naphthylphenylenediamine, or a polyamine with general formula R1-Ar-NH-C6H3(R2)(R3), in which Ar is the aromatic group, R1 = H, -NH2, -NH-aryl-NH2, -NH-arylalkyl-NH2, -NH-alkyl-NH2, -NH-aryl, -NH-aryl-alkyl, -NH-alkyl, or branched C4-24-hydrocarbyl; R2 = -NH2, -(NH(CH2)n)m-NH2, -CH2-(CH2)n-NH2, or -aryl-NH2, in which n and m = 1-10; and R3 = H and C4-24-alkyl, -alkenyl, -alkoxy, -arylalkyl, or -alkaryl, in which only one or R2 and R3 has a terminal -NH2 group. The composition is suitable for use as an additive in crankcase lubricating oils, drive-train lubricants, gear lubricants, and lubricating greases.

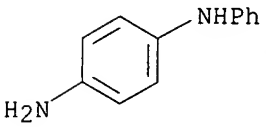
ST lubricant dispersant amination hydrocarbylsuccinic anhydride polyamine; aliph arom polyamine polyisobutenylsuccinic anhydride lubricant dispersant; lubricating oil grease polyisobutenyl succinate polyamine dispersant; crankcase oil polyisobutenyl succinate polyamine dispersant; gear transmission lubricant polyisobutenyl succinate polyamine dispersant

IT Diesel fuel additives
Fuel additives
Fuel oil additives
Gasoline additives
Lubricating grease additives

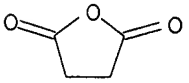
Lubricating oil additives
(dispersants; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
IT Dispersing agents
(fuel oil additives; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
IT Lubricating oils
(gear oils; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
IT Lubricating oil additives
(multifunctional; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
IT Amines, uses
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(polyamines, aliphatic, nonpolymeric, reaction products with polyalkenylsuccinic anhydride and aromatic amines; dispersants; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines
as dispersants for lubricants and fuels)
IT Amines, uses
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(polyamines, nonpolymeric, aromatic, reaction products with aliphatic polyamines and polyalkenylsuccinic anhydride; dispersants; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines
as dispersants for lubricants and fuels)
IT Amines, uses
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(polyamines, nonpolymeric, polyethylene-, reaction products with polyalkenylsuccinic anhydride and aromatic amines; dispersants; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines
as dispersants for lubricants and fuels)
IT Hydraulic fluids
(transmission, automatic; reaction products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
IT **101-54-2D**, N-Phenyl-1,4-phenylenediamine, **reaction** products with aliphatic polyamines and polyalkenylsuccinic anhydride
108-30-5D, Succinic anhydride, **polyisobutenyl** derivs., **reaction** products with aliphatic polyamines and aromatic polyamines
10368-27-1D, reaction products with aliphatic polyamines and polyalkenylsuccinic anhydride 84582-75-2D, E 100 (amine), reaction products with aliphatic polyamines and polyalkenylsuccinic anhydride
RL: **MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)**
(dispersants; **reaction** products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)
RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ethyl Corporation; EP 0909805 A 1999 HCAPLUS
(2) Infineum International Limited; EP 1318188 A 2003 HCAPLUS
(3) Liu; US 6117825 A 2000 HCAPLUS
IT **101-54-2D**, N-Phenyl-1,4-phenylenediamine, **reaction** products with aliphatic polyamines and polyalkenylsuccinic anhydride

108-30-5D, Succinic anhydride, **polyisobutenyl** derivs., **reaction** products with aliphatic polyamines and aromatic polyamines
RL: **MOA (Modifier or additive use)**; **RCT (Reactant)**; **RACT (Reactant or reagent)**; **USES (Uses)**
(dispersants; **reaction** products of polyalkenylsuccinic anhydrides with aliphatic and aromatic amines as dispersants for lubricants and fuels)

RN 101-54-2 HCAPLUS
CN 1,4-Benzenediamine, N-phenyl- (9CI) (CA INDEX NAME)



RN 108-30-5 HCAPLUS
CN 2,5-Furandione, dihydro- (9CI) (CA INDEX NAME)



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Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Ethyl Corporation	1999			EP 0909805 A	HCAPLUS
Infineum International	2003			EP 1318188 A	HCAPLUS
Liu	2000			US 6117825 A	HCAPLUS

L103 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:636202 HCAPLUS
DN 133:225424
ED Entered STN: 13 Sep 2000
TI Polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compositions
IN Liu, Christopher Soundang; Migdal, Cyril Andrew; Crawford, Norris Roland; Yamamota, Roy Isamu
PA **Ethyl** Corporation, USA
SO U.S., 19 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM C10M0149-06
ICS C10M0133-16
INCL 508291000
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6117825	A	20000912	US 1992-879401	19920507
PRAI	US 1992-879401		19920507		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES

US 6117825 ICM C10M0149-06
ICS C10M0133-16
INCL 508291000
IPCI C10M0149-06 [ICM,7]; C10M0149-00 [ICM,7,C*];
C10M0133-16 [ICS,7]; C10M0133-00 [ICS,7,C*]
IPCR C10M0133-00 [I,C*]; C10M0133-52 [I,A]; C10M0133-56 [I,A]
NCL 508/291.000; 508/290.000; 508/293.000
ECLA C10M133/52; C10M133/56

AB A lubricating oil composition comprising: (a) a major amount of an oil of lubricating viscosity; and (b) a minor dispersant amount of a synergistic combination of an antioxidant-dispersant additive and a dispersant additive, said combination comprising: (i) a polyisobutylene succinimide; and (ii) an ethylene-propylene succinimide.

ST lubricating oil polyisobutylene succinimide dispersant additive

IT Alcohols, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(C14-16, ethoxylated; polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

IT Lubricating oil additives
(dispersants; polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

IT Lubricating oils
(polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

IT **123-56-8D**, Succinimide, **reaction** products with ethylene-propylene copolymer 9010-79-1D, Ethylene-Propylene Copolymer, grafted with maleic anhydride
RL: **MOA (Modifier or additive use); USES (Uses)**
(polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

IT 50-00-0, Formaldehyde, reactions 79-14-1, Glycolic acid, reactions 80-43-3, Dicumyl peroxide **101-54-2**, N-Phenyl-p-phenylenediamine **108-30-5D**, Succinic acid anhydride, **isobutenyl** derivs **108-31-6**, Maleic anhydride, **reactions** 109-55-7 **4067-16-7**, Pentaethylenehexamine **5840-03-9**, 1,3-Benzenediamine, N-phenyl- 9016-45-9, Surfonic N-40 25154-52-3, Nonylphenol
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

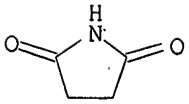
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Karol; US 4482464 1984 HCAPLUS
(2) Migdal; US 5075383 1991 HCAPLUS
(3) Nalesnik; US 4636322 1987 HCAPLUS
(4) Nalesnik; US 4699724 1987 HCAPLUS

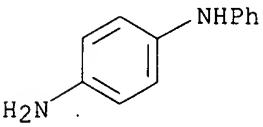
IT **123-56-8D**, Succinimide, **reaction** products with ethylene-propylene copolymer
RL: **MOA (Modifier or additive use); USES (Uses)**
(polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

RN 123-56-8 HCAPLUS
CN 2,5-Pyrrolidinedione (9CI) (CA INDEX NAME)

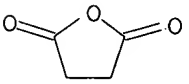


IT **101-54-2**, N-Phenyl-p-phenylenediamine **108-30-5D**,
Succinic acid anhydride, **isobutenyl** derivs **108-31-6**,
Maleic anhydride, **reactions 4067-16-7**,
Pentaethylenehexamine **5840-03-9**, 1,3-Benzenediamine, N-phenyl-
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(polyisobutylene succinimide and ethylene-propylene succinimide synergistic additives for lubricating oil compns.)

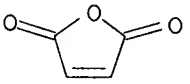
RN 101-54-2 HCAPLUS
CN 1,4-Benzenediamine, N-phenyl- (9CI) (CA INDEX NAME)



RN 108-30-5 HCAPLUS
CN 2,5-Furandione, dihydro- (9CI) (CA INDEX NAME)



RN 108-31-6 HCAPLUS
CN 2,5-Furandione (9CI) (CA INDEX NAME)



RN 4067-16-7 HCAPLUS
CN 3,6,9,12-Tetraazatetradecane-1,14-diamine (9CI) (CA INDEX NAME)

PAGE 1-A

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PAGE 1-B

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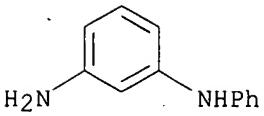
RN 5840-03-9 HCAPLUS
CN 1,3-Benzenediamine, N-phenyl- (9CI) (CA INDEX NAME)



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Karol	1984			US 4482464	HCAPLUS
Migdal	1991			US 5075383	HCAPLUS
Nalesnik	1987			US 4636322	HCAPLUS
Nalesnik	1987			US 4699724	HCAPLUS

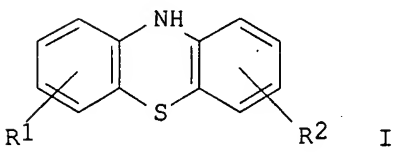
L103 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1997:260100 HCAPLUS
DN 126:307208
ED Entered STN: 23 Apr 1997
TI Polyisobutylene succinimide, ethylene-propylene succinimide and an alkylated phenothiazine additive for lubricating oil compositions
IN Esche, Carl K., Jr.; Migdal, Cyril A.; Sanderson, John R.; Ippolito, Anthony L.
PA **Ethyl** Additives Corporation, USA
SO U.S., 8 pp., Cont. of U.S. Ser. No. 384,804, abandoned.
CODEN: USXXAM
DT Patent
LA English
IC ICM C10M0157-04
INCL 508251000
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5614124	A	19970325	US 1995-481212	19950607
PRAI	US 1993-159611	B1	19931201		
	US 1995-384804	B1	19950206		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 5614124	ICM	C10M0157-04
	INCL	508251000
	IPCI	C10M0157-04 [ICM,6]; C10M0157-00 [ICM,6,C*]
	IPCR	C10M0141-00 [I,C*]; C10M0141-08 [I,A]; C10M0163-00 [I,C*]; C10M0163-00 [I,A]
	NCL	508/251.000
	ECLA	C10M141/08; C10M163/00

OS MARPAT 126:307208
GI



I

AB A lubricating oil composition comprises (a) a major amount of an oil of lubricating viscosity; and (b) a minor amount of a synergistic combination of an antioxidant-dispersant additive and a dispersant additive, the combination comprising: (i) a polyisobutylene succinimide; (ii) an ethylene-propylene succinimide; and (iii) an alkylated phenothiazine represented by the formula I, where R1 is a linear or branched C4-24 alkyl, heteroalkyl or alkylaryl group; and R2 is H or a linear or branched C4-24 alkyl group.

ST polyisobutylene succinimide dispersant lubricating oil additive; alkylated phenothiazine antioxidant dispersant lubricating oil; ethylene propylene succinimide antioxidant dispersant lubricating

IT Lubricating oil additives
(antioxidants; alkylated phenothiazines)

IT Lubricating oils
(crankcase; polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

IT **101-54-2DP**, N-Phenyl-p-phenylenediamine, **reaction** products with ethylene-maleic anhydride-propylene graft copolymer 109-55-7DP, reaction products with ethylene-maleic anhydride-propylene graft copolymer and N-Phenyl-p-phenylenediamine 106177-14-4DP, Ethylene-maleic anhydride-propylene graft copolymer, reaction products with N-phenyl-p-phenylenediamine and/or N,N-dimethylaminopropylamine RL: IMF (Industrial manufacture); **MOA (Modifier or additive use)** ; PREP (Preparation); **USES (Uses)**
(antioxidants-dispersants; polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

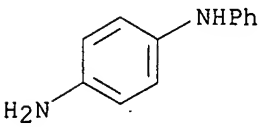
IT 50-00-0DP, Formaldehyde, reaction products with polyisobutenylsuccinic anhydride, pentaethylenehexamine, 4-hydroxydiphenylamine and glycolic acid, uses 79-14-1DP, Glycolic acid, reaction products with polyisobutenylsuccinic anhydride, pentaethylenehexamine, 4-hydroxydiphenylamine and formaldehyde **108-30-5DP**, Succinic anhydride, **polyisobutenyl** derivs., **reaction** products with pentaethylenehexamine, 4-hydroxydiphenylamine, formaldehyde and glycolic acid 122-37-2DP, 4-Hydroxydiphenylamine, reaction products with polyisobutenylsuccinic anhydride, pentaethylenehexamine, formaldehyde and glycolic acid **4067-16-7DP**, Pentaethylenehexamine, **reaction** products with polyisobutenylsuccinic anhydride, 4-hydroxydiphenylamine, formaldehyde and glycolic acid RL: IMF (Industrial manufacture); **MOA (Modifier or additive use)** ; PREP (Preparation); **USES (Uses)**
(dispersants; polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

IT 92-84-2DP, Phenothiazine, tetradecyl or decyl derivs.
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

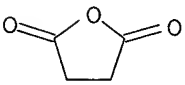
IT 122-39-4DP, Diphenylamine, tetradecyl or decyl derivs.
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

IT 122-39-4, Diphenylamine, reactions 872-05-9, 1-Decene 1120-36-1, 1-Tetradecene
RL: RCT (Reactant); RACT (Reactant or reagent)
(polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)

IT **101-54-2DP**, N-Phenyl-p-phenylenediamine, **reaction** products with ethylene-maleic anhydride-propylene graft copolymer
RL: IMF (Industrial manufacture); **MOA (Modifier or additive use)** ; PREP (Preparation); **USES (Uses)**
(antioxidants-dispersants; polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)
RN 101-54-2 HCAPLUS
CN 1,4-Benzenediamine, N-phenyl- (9CI) (CA INDEX NAME)



IT **108-30-5DP**, Succinic anhydride, **polyisobutenyl** derivs., **reaction** products with pentaethylenehexamine, 4-hydroxydiphenylamine, formaldehyde and glycolic acid **4067-16-7DP** , Pentaethylenehexamine, **reaction** products with polyisobutenylsuccinic anhydride, 4-hydroxydiphenylamine, formaldehyde and glycolic acid
RL: IMF (Industrial manufacture); **MOA (Modifier or additive use)** ; PREP (Preparation); **USES (Uses)**
(dispersants; polyisobutylene succinimide, ethylene-propylene succinimide and alkylated phenothiazine additives for lubricating oil compns.)
RN 108-30-5 HCAPLUS
CN 2,5-Furandione, dihydro- (9CI) (CA INDEX NAME)



RN 4067-16-7 HCAPLUS
CN 3,6,9,12-Tetraazatetradecane-1,14-diamine (9CI) (CA INDEX NAME)

PAGE 1-A

$H_2N-CH_2-CH_2-NH-CH_2-CH_2-NH-CH_2-CH_2-NH-CH_2-CH_2-NH-CH_2-$

PAGE 1-B

$-CH_2-NH_2$

=> d his

(FILE 'HOME' ENTERED AT 12:40:21 ON 14 NOV 2006)
SET COST OFF

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     FILE 'HCAPLUS' ENTERED AT 12:40:38 ON 14 NOV 2006
L1             1 S US20050202980/PN OR US2004-797877#/AP,PRN
                 E AFTON/PA,CS
L2            44 S E3-E25
                 E ETHYLPA,CS
                 E ETHYL/PA,CS
L3          4025 S E3,E4
                 E ETHYL PET/PA,CS
L4           196 S E5-E47
                 E LOPER/AU
                 E LOPER J/AU
L5            25 S E3,E7,E8
                 E GRIFFIN/AU
                 E GRIFFIN P/AU
L6            40 S E3,E11
L7            27 S E38,E42,E43
                 E HUTCHISON/AU
L8             1 S E3
                 E HUTCHISON D/AU
L9            13 S E3,E4
L10           10 S E15-E17
                 E DITTMEIER/AU
L11            1 S E5
                 E DITMEIER/AU
                 SEL RN L1

     FILE 'REGISTRY' ENTERED AT 12:43:49 ON 14 NOV 2006
L12            4 S E1-E4
L13            1 S L12 AND OC4/ES
                 E POLYISOBUTYLENE/CN
L14            1 S E3
L15        45289 S OC4/ES AND 1/NR AND 3/ELC.SUB AND (C AND H AND O)/ELS
L16        26519 S (108-30-5 OR 108-31-6)/CRN
L17          420 S L16 AND 115-11-7/CRN
L18           88 S L17 AND 46.150.18/RID
L19           42 S L18 AND N/ELS
L20          270 S C8H10O3/MF AND OC4/ES
L21           26 S L20 AND 2 5 FURANDIONE
L22           18 S L21 AND DIHYDRO
L23            2 S 45896-82-0 OR 18908-20-8
L24           37 S (C4H5NO2 OR C4H3NO2)/MF AND NC4/ES
L25            9 S L24 AND 2 5 NOT D/ELS
L26            3 S L25 NOT (RADICAL OR 14C2 OR 15N)
L27            2 S L26 NOT DIOL
L28            4 S 108-30-5 OR 108-31-6 OR L27
L29            1 S C12H12N2 AND L12
L30              STR
L31              SCR 1993
L32           50 S L30 AND L31
L33        37070 S L30 AND L31 FUL
L34              STR
L35           50 S L34 SAM SUB=L33
L36         3209 S L34 FUL SUB=L33
                 SAV L36 GOLOB797/A
L37           67 S L36 AND (OC4 OR NC4)/ES
L38           17 S L37 AND PMS/CI
L39          409 S L36 AND PMS/CI NOT L38
L40          318 S L39 NOT (SI OR P OR S)/ELS
L41          294 S L40 NOT F/ELS
L42          265 S L41 NOT (OC2 OR C4-OC4-OC4)/ES
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L43          190 S L42 NOT C8H4CL2O2
L44          154 S L43 NOT (B/ELS OR C6-C6/ES OR OC4-C6/ES)
L45          144 S L44 NOT OC4-OC4-C6/ES
L46          118 S L45 NOT (C8H6O4 OR C6H6O2)
L47          139 S L45 NOT C6H7N
L48          129 S L47 NOT C6H6O2
L49          113 S L48 NOT C8H6O4
L50          109 S L49 NOT (46.150.1/RID OR C5-C5-C6-C6-C6-C6/ES)
L51         2733 S L36 NOT L37-L50
L52         2246 S L51 AND 1/NC
L53           20 S L52 AND IDS/CI
L54         2226 S L52 NOT L53
L55            7 S L54 AND C12H12N2
L56            3 S L55 NOT (D/ELS OR RADICAL)
L57            1 S 115-11-7

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     FILE 'REGISTRY' ENTERED AT 13:18:39 ON 14 NOV 2006
L58            1 S L12 AND C6-C6/ES

     FILE 'HCAPLUS' ENTERED AT 13:18:58 ON 14 NOV 2006
L59        49145 S L28
L60        16885 S L28 (L) RACT+NT/RL
L61         4791 S L28 (L) MOA/RL
L62         1116 S L28/D (L) (ISOBUTENYL OR POLYISOBUTENYL OR POLY ISOBUTENYL)
L63          455 S L62 AND L60,L61
L64          375 S L14,L57 AND L60,L61
L65          716 S L63,L64
L66            3 S L29,L56 AND L65
L67            3 S L54 AND L65
L68            3 S L66,L67

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                SEL RN L28
L69        27081 S E1-E4/CRN
L70          422 S L69 AND 115-11-7/CRN
L71          163 S L70 AND N/ELS
L72          152 S L71 NOT C10H7NO2
L73          134 S L72 NOT (OC2/ES OR C2H4O)
L74            2 S L73 AND 2/NC
L75           51 S L73 AND 3/NC
L76            9 S L75 AND (C4H15N5 OR C2H8N2 OR C13H29N OR C4H13N3 OR C8H23N5 O
L77            3 S L75 AND NC2/ES
L78            1 S L75 AND NC6/ES
L79            9 S L75 AND NC4/ES AND OC4/ES
L80           22 S L76-L79
                SEL RN 1-3 9 13 16-21
L81           11 S E5-E15
L82           13 S L74,L81
L83           57 S L73 AND 4/NC
L84           16 S L83 AND NA/ELS
L85            1 S L83 AND H3N AND NC4/ES AND OC4/ES
                SEL RN L84 2 9 12 16
L86            4 S E16-E19
L87           18 S L82,L85,L86

     FILE 'HCAPLUS' ENTERED AT 13:40:29 ON 14 NOV 2006
L88          187 S L87
L89            0 S L88 AND L56
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